



NOvA Experiment Status

Steve Magill Argonne National Laboratory
All Experimenter's Meeting, September 9, 2013

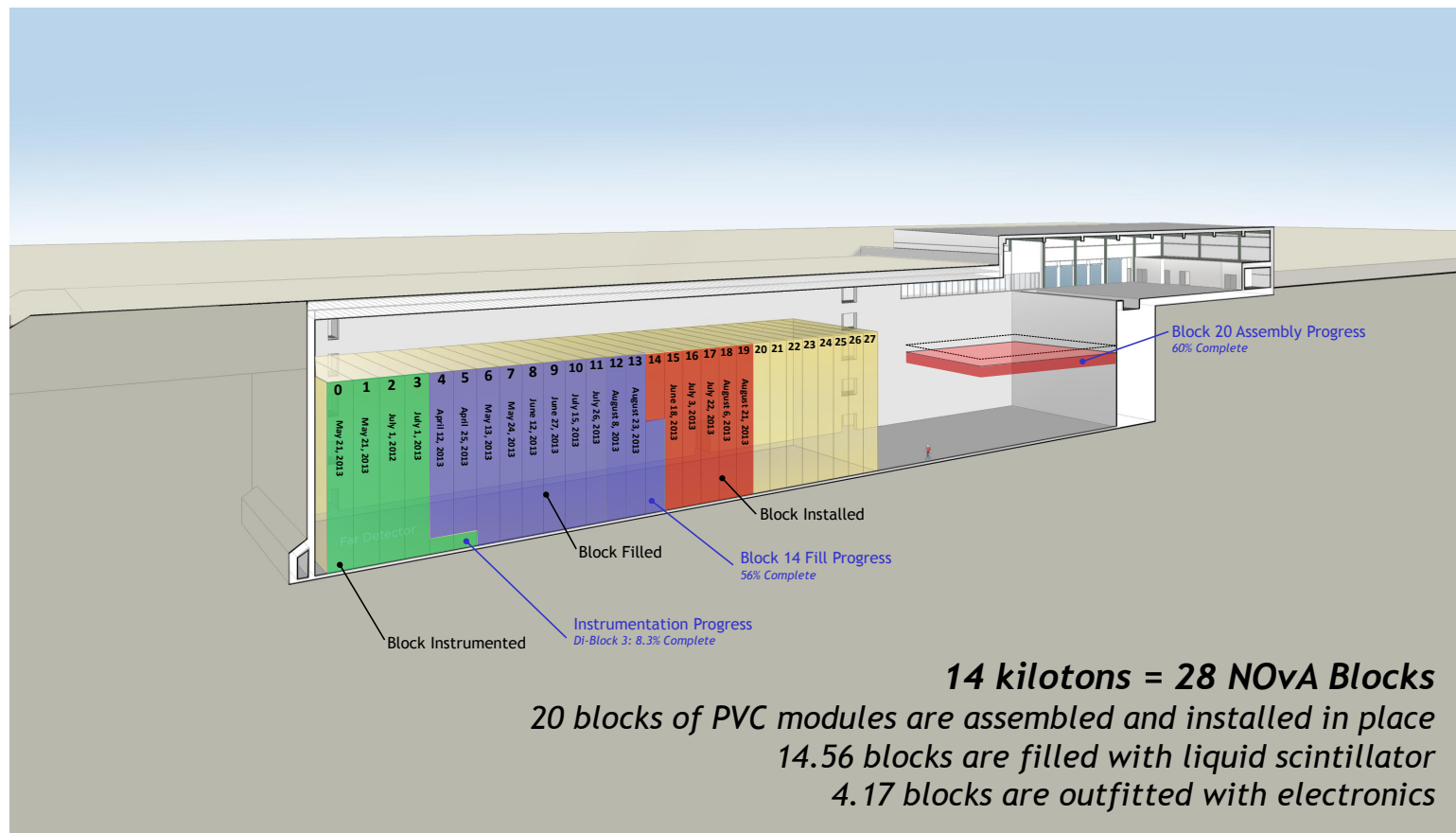
Far Detector Progress



The Intensity Frontier

NOvA Far Detector Assembly Progress

Status Date: 02SEP13



Di-Block Status (9/09/13)

[illegible]

Filling

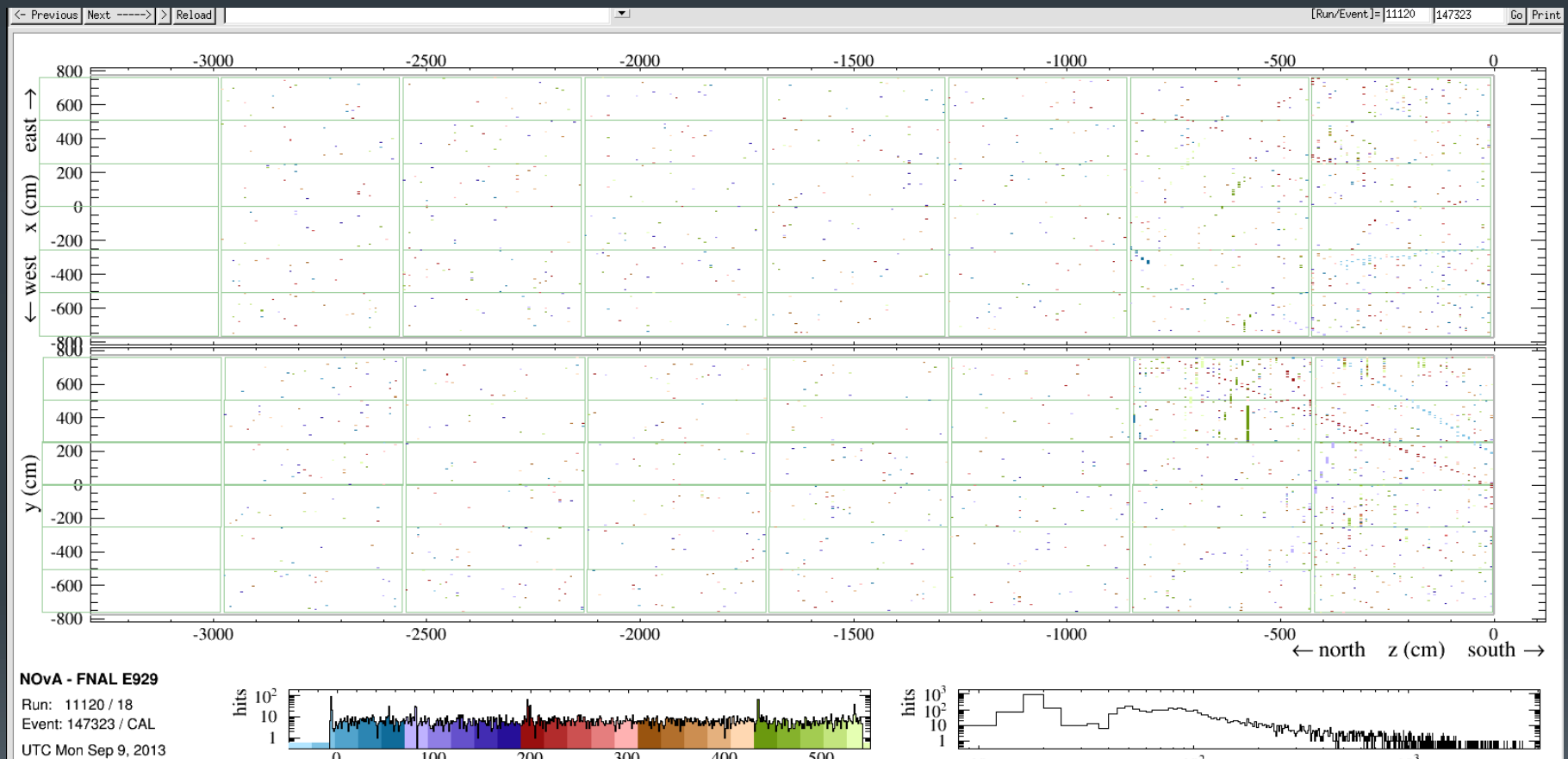
Top Up block 14 (15th block) horizontals. Install water cooling instrument/valve labels. Install FEBs block 14.

Tuesday 9/10/13: Begin filling block 15 (16th block) horizontals

| | | Vertical Modules | | | | | | | | | | | | | |
|-------------------------|----|-----------------------|----|----|-----------------------|----|-----------------------|----|---------------------|----|---------------------|---|--------------------|---|--------------------|
| Position | 31 | 29 | 27 | 25 | 23 | 21 | 19 | 17 | 15 | 13 | 11 | 9 | 7 | 5 | 3 |
| | 0 | Thursday day 9/19/13 | | | Wednesday eve 9/18/13 | | Wednesday day 9/18/13 | | Tuesday eve 9/17/13 | | Tuesday day 9/17/13 | | Monday eve 9/16/13 | | Monday day 9/16/13 |
| | 1 | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | |
| | | Horizontal Modules | | | | | | | | | | | | | |
| Position | 30 | 28 | 26 | 24 | 22 | 20 | 18 | 16 | 14 | 12 | 10 | 8 | 6 | 4 | 2 |
| Thursday eve 9/25/13 | 11 | | | | | | | | | | | | | | |
| | 10 | Thursday eve 9/12/13 | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | | |
| | 8 | Thursday day 9/12/13 | | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | | |
| Friday day 9/20/13 | 6 | Wednesday eve 9/11/13 | | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | | | |
| | 4 | Wednesday day 9/11/13 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 2 | Tuesday eve 9/10/13 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | |
| | 0 | Tuesday day 9/10/13 | | | | | | | | | | | | | |

| | | Vertical Modules | | | | | | | | | | | | | | | |
|----------------------|----------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| | | Position | 31 | 29 | 27 | 25 | 23 | 21 | 19 | 17 | 15 | 13 | 11 | 9 | 7 | 5 | 3 |
| Monday day 9/9/13 | 0 | 250 | 250 | 251 | 251 | 250 | 248 | 250 | 251 | 249 | 249 | 250 | 250 | 251 | 252 | 247 | 2 |
| | 1 | 251 | 250 | 250 | 250 | 250 | 248 | 249 | 249 | 250 | 250 | 251 | 250 | 251 | 250 | 252 | 2 |
| | 2 | 250 | 246 | 251 | 249 | 252 | 246 | 253 | 249 | 250 | 247 | 251 | 251 | 248 | 248 | 248 | 2 |
| | 3 | 249 | 251 | 246 | 249 | 250 | 248 | 249 | 250 | 251 | 250 | 250 | 247 | 250 | 248 | 249 | 2 |
| | 4 | 252 | 252 | 252 | 250 | 252 | 250 | 251 | 253 | 252 | 249 | 252 | 250 | 248 | 252 | 250 | 2 |
| | 5 | 251 | 251 | 251 | 251 | 252 | 250 | 250 | 252 | 253 | 250 | 250 | 250 | 252 | 252 | 250 | 2 |
| | 6 | 251 | 248 | 251 | 250 | 249 | 250 | 252 | 249 | 252 | 251 | 249 | 251 | 251 | 251 | 251 | 2 |
| | 7 | 251 | 250 | 250 | 253 | 250 | 249 | 249 | 252 | 251 | 249 | 247 | 249 | 252 | 250 | 251 | 2 |
| | 8 | 250 | 251 | 250 | 250 | 251 | 250 | 253 | 251 | 250 | 249 | 251 | 247 | 249 | 249 | 248 | 2 |
| | 9 | 250 | 252 | 249 | 251 | 249 | 250 | 251 | 252 | 249 | 249 | 251 | 249 | 252 | 251 | 250 | 2 |
| | 10 | 250 | 251 | 252 | 252 | 250 | 251 | 250 | 253 | 250 | 251 | 252 | 250 | 250 | 252 | 250 | 2 |
| 11 | 251 | 253 | 251 | 252 | 253 | 250 | 250 | 253 | 253 | 250 | 250 | 250 | 252 | 252 | 252 | 2 | |
| Monday eve 9/9/13 | Position | 30 | 28 | 26 | 24 | 22 | 20 | 18 | 16 | 14 | 12 | 10 | 8 | 6 | 4 | 2 | |
| | 11 | 246 | 246 | 249 | 241 | 235 | 245 | 245 | 245 | 232 | 240 | 230 | 245 | 220 | 224 | 243 | 2 |
| | 10 | 242 | 245 | 243 | 250 | 245 | 244 | 241 | 248 | 246 | 245 | 246 | 246 | 244 | 244 | 241 | 2 |
| | 9 | 241 | 245 | 246 | 245 | 249 | 247 | 215 | 241 | 245 | 245 | 252 | 237 | 244 | 239 | 250 | 2 |
| | 8 | 246 | 225 | 247 | 243 | 242 | 247 | 210 | 235 | 244 | 244 | 239 | 241 | 245 | 230 | 238 | 2 |
| | 7 | 246 | 241 | 246 | 244 | 244 | 244 | 244 | 243 | 233 | 248 | 245 | 254 | 236 | 247 | 247 | 2 |
| | 6 | 244 | 243 | 247 | 246 | 246 | 247 | 247 | 237 | 245 | 245 | 245 | 246 | 240 | 244 | 245 | 2 |
| | 5 | 243 | 239 | 246 | 245 | 243 | 242 | 245 | 231 | 242 | 244 | 243 | 232 | 241 | 213 | 246 | 2 |
| | 4 | 244 | 245 | 244 | 247 | 243 | 248 | 244 | 240 | 244 | 243 | 239 | 238 | 245 | 241 | 244 | 2 |
| | 3 | 246 | 240 | 245 | 243 | 245 | 247 | 246 | 243 | 244 | 243 | 246 | 242 | 245 | 241 | 245 | 2 |
| | 2 | 246 | 245 | 246 | 248 | 246 | 248 | 246 | 245 | 247 | 246 | 243 | 244 | 244 | 246 | 247 | 2 |
| 1 | 251 | 248 | 250 | 245 | 245 | 244 | 245 | 250 | 242 | 250 | 246 | 246 | 248 | 246 | 248 | 2 | |
| 0 | 246 | 245 | 245 | 245 | 244 | 243 | 244 | 244 | 246 | 242 | 245 | 245 | 247 | 228 | 241 | 2 | |

FarDet Event

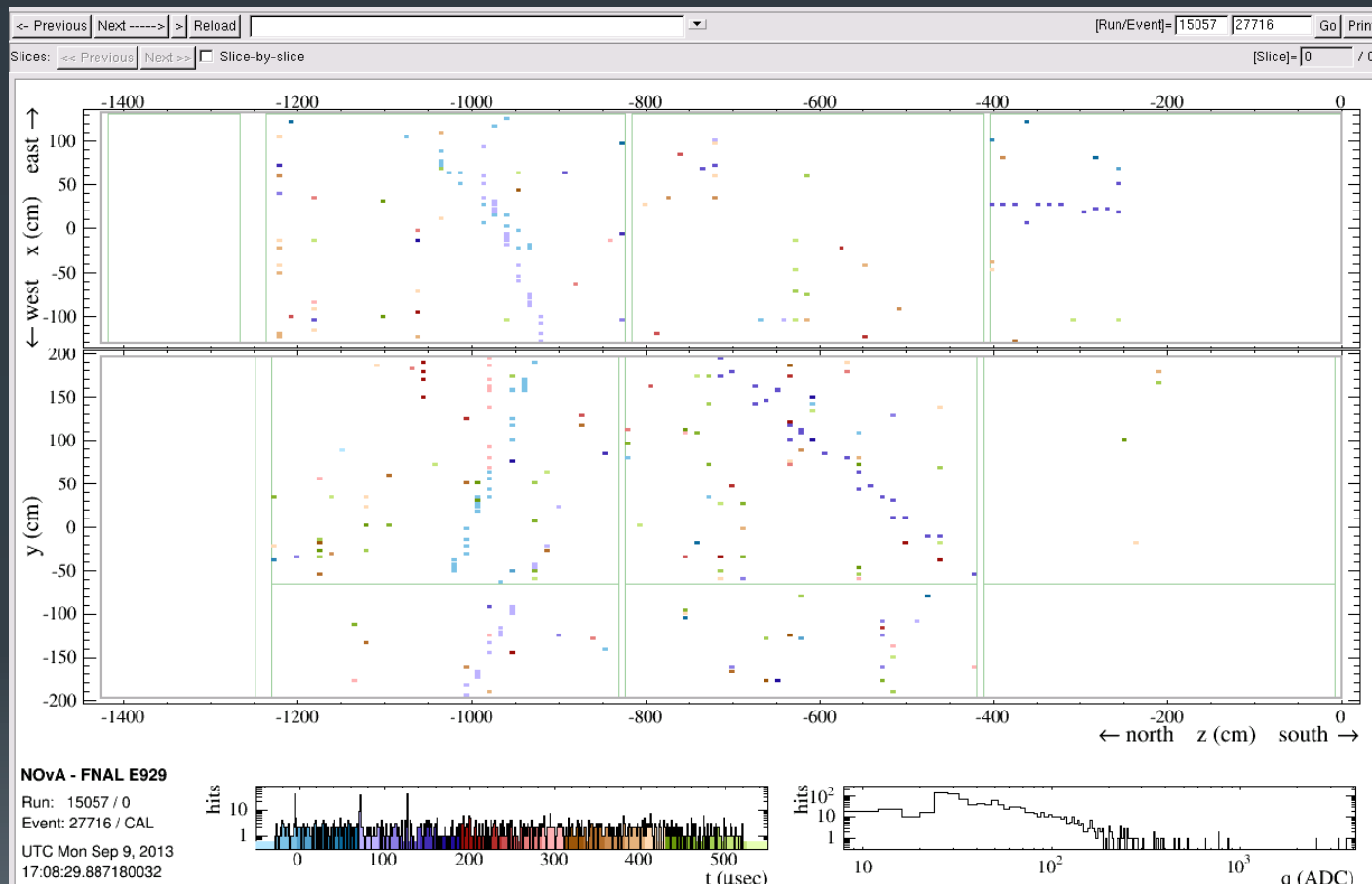


Diblocks 1,2 (0 -> -850 cm) fully instrumented with APDs
Diblocks 3-7 (-850 -> -3000 cm) have Front-End Boards installed
550 μ sec trigger window

FarDet Progress

- Taking data with 2+ ktons of fully-instrumented detector
- APDs running warm, 1 kton at nominal HV (APD gain = 100)
 - Evaluation of detector performance ongoing
 - Studies of noise levels in detector
- APD cooling hardware/firmware/software in final testing stage – ready for on-detector operations this week
- Over half of FarDet filled with scintillator
- 21st Block being installed today

Near Detector On Surface (NDOS)



- NOvA prototype detector still running continuously
- Useful for beam timing measurements, FarDet prediction
- Test Stand (30 APDs) used to study APD noise rates

First ND Block Installed



First PVC Block Installed Aug. 21

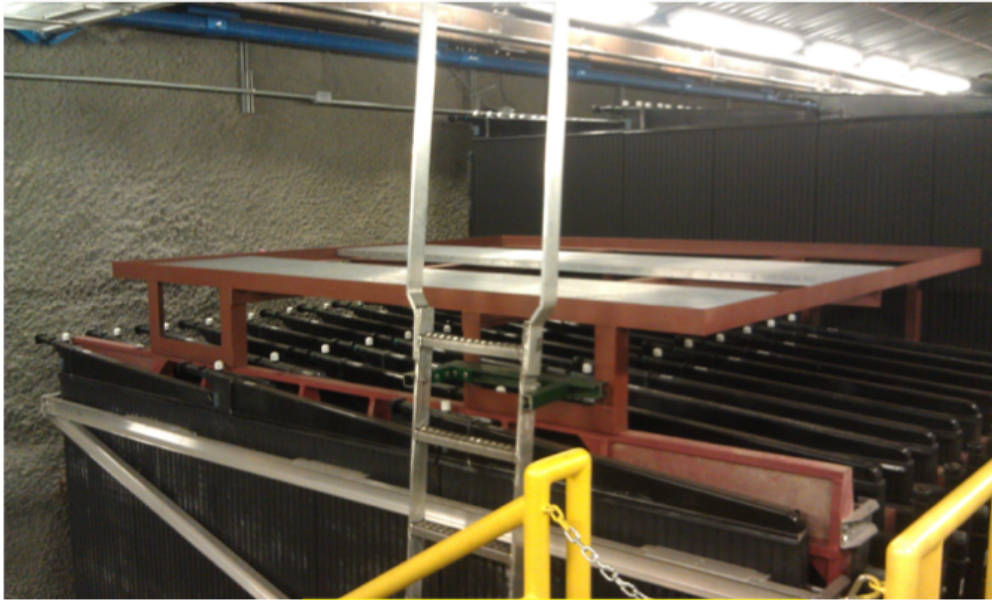


- *Upstream face was aligned using plumb bob and ruler*
- *As-build position being measured by alignment now*
- *Will use it as template to position next block*

ND Muon Catcher, First Block



Muon Catcher Access Ladder



Ladder installed Aug. 27



- Please read and sign the JHA (docDB 9813)
- Do not block the egress ladder nearby

Near Detector Progress



September Schedule



- Scintillator piping connections: Sept 9-13, 2MT
 - ✧ Connection to scintillator distribution plumbing
 - ✧ Connection to ISO tanker
 - ✧ System under engineering and ESH reviews
- Block #2
 - ✧ Assembly: Sept 4 -17, 4MT
 - ✧ Transfer: Sept 19, 4MT
 - ✧ Survey: Sept 23-24
 - ✧ Installation: Sept 25-26, 4MT
- Block #3
 - ✧ Table and pallet installation/alignment: Sept 19-20
 - ✧ Assembly: Sept 23-Oct 4
- Cooling and dry-air installation: 2MT
 - ✧ Detail schedule under discussion
- Muon catcher PDB/DCM installation and cabling: Sept 9-13
 - ✧ Need network IP assignment
 - ✧ Need checkout procedures
 - ✧ Electronics cabling and grounding ORC review underway
- Scintillator filing machines delivery to FNAL: Sept 23?
 - ✧ ORC review documentation in preparation

Summary

- Currently taking data with 2 kilotons of the Far Detector with full electronics (warm APDs at nominal gain)
 - > 1 million gallons of liquid scintillator in the detector
 - Preparing to start cold APD operations this week
- 24 hour shift coverage started last week
 - High up-time during beam operations
 - Monitoring cooling status
- Close attention to NDOS operations to capture beam timing